A STUDY ON ASSOCIATION OF THYROID FUNCTION AND FRAILTY IN ELDERLY

ABSTRACT

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CONTEXT :Both frailty and thyroid dysfunctions are common in elderly. But dat regarding the relationship between these conditions are scarce and conflicting.

AIM: To investigate into the relationship between Thyroid Functionand Frailty in elderly.

OBJECTIVES:

1) To find the prevalence of Frailty in op and ip patients attendinga tertiary care centre.
2) To find association between fT4, fT3,TSH levels and Frail, Pre-frail, Robust/Non-frail Category.
3) To find correlation between fT4, fT3, TSH and individualcomponents of Frailty Phenotype Criteria

MATERIALS AND METHODS:

Study Design : cross-sectional study

Study Setting : Rajiv Gandhi Govt. General Hospital ,Chennai-600003, Tamilnadu.

Study Duration : 6 months (February 2017 to July 2017)

Sample Size : 200 patients

Inclusion Criteria : Persons aged above 60 years willing to consent for the study.

Exclusion Criteria:

- Persons aged above 60 years not willing to consent for the study.
- Critically ill patients like advanced cardiac failure, stage 4,5 CKD.
- Acute stroke, previous stroke with major residual deficits
- Parkinson's disease, dementia, bed ridden – immobile patients, H/o hip replacement
- Known hypothyroidism patient on thyroxine supplementation
- Known hyperthyroidism patient on antithyroid drugs.
- H/o medications like beta blockers, amiodarone , lithium
- H/o radiation in the past, thyroid surgeries.
- H/o malignancies

METHODS : Study participants were selected as per above said inclusion and exclusion criteria . Selected clinical history of co-existing problems and conditions were obtained. We have assessed the study participants with a modified construct of Fried's Frailty Phenotype criteria to categorise them as Non-Frail , Pre-Frail and Frail based on the presence of number components with 0 component as Non-Frail , 1-2 components as Pre-Frail , 3-5 components as Frail. After categorising them in three separate groups , we have withdrawn venous blood samples from each participant from

each group to estimate their blood levels of free thyroxine , free T3 and Thyroid stimulating Hormone by Chemiluminescent Immuno assay Method. We have cross-sectionally assessed the relationship between 3 categories of frailty status and fT3 ,fT4 and TSH levels. In addition we have also assessed the relationship between individual components of frailty and fT3 ,fT4 and TSH levels by correlation.

RESULTS : Of the 200 subjects studied 36%(n=72) are found to be frail,43%(n=86) are pre-frail and 21%(n=42) are non frail. Mean fT4 levels are lesser in non frail group (0.89±0.13) than prefrail(1.02±0.14) and frail groups(1.29±0.27).Conversely , the mean fT4 levels are high in frail group when compared to other two groups and is statistically significant with f value 67.081 and p value <0.001. Whereas for fT3 and TSH their mean values doesn't show significant difference among non frail(3.256± 0.56 & 3.95±0.92) pre frail(3.25±0.92&2.41± 2.04) , frail groups(3.34±1.16 &3.77±6.67).

Mean fT4 levels in subjects without vs with, weight loss (1.06±0.23 vs 1.29±0.28) , weakness (0.96±0.16 vs 1.16±0.27) ,slowness (0.97±0.20 vs 1.16±0.26), exhaustion(1.01±0.21 vs 1.27) and low physical activity (1.01±0.21 vs 1.20±1.17) show statistically significant difference with p value<0.001 for all the five components.And the mean fT4 levels are high for all the subjects who have positivity for individual frailty phenotypic components. Whereas on looking the result for mean fT3 and TSH levels, only the subjects with and without exhaustion show significant difference for mean fT3 levels and not for mean TSH levels. Other components of frailty phenotype criteria doesn't show significant difference for mean fT3 and TSH levels.And on correlation it is found that weight loss, gait speed , exhaustion correlate positively with fT4 levels whereas the correlation is negative for hand grip and PASE and exhaustion is also found to correlate positively with TSH.And then fT4 levels correlate positively with number of components of frailty.

CONCLUSION :In our study it is evident that mean fT4 levels are higher in both Frail elderly males and females and there is statistically significant difference among the Frail, Pre- frail, Non-frail groups. Also mean fT4 levels correlate independently with the components of frailty phenotype.We conclude that in Elderly, higher mean fT4 levels is an independent predictor of Frailty and also thyroxine levels have independent correlation with components of Fried's Frailty Phenotype Criteria.

Further prospective studies are needed to see whether Frailty status causes alteration in thyroxine levels or thyroxine hormone has a causative role in the pathophysiology of Frailty.